BUREAU OF HIGHWAYS
REQUEST FOR PROPOSAL
for
QUALIFICATIONS BASED SELECTION FOR PREQUALIFIED SERVICES

The Michigan Department of Transportation (MDOT) is seeking professional services for the project contained in the attached scope of services.

If your firm is currently prequalified for this type of work and you are interested in providing services, please indicate your interest by submitting a Proposal. The Proposal must be submitted in accordance with the latest "Vendor Selection Guidelines for Service Contracts", available on the MDOT website.

For efficiency sake, we are asking that the vendor firm provide **3** paper copies of the Proposal to the MDOT Survey Project Manager named in the attached scope of services.

These copies must be received by **4:00 am on Monday, December 13, 2004.** Fax and electronic copies are not acceptable.

In addition, provide one unbound copy to:

Regular Mail:
Secretary, Operations Contract Support
Michigan Department of Transportation
P.O. Box 30050
Lansing, MI 48909

OR

Overnight Mail:
Secretary, Operations Contract Support
Michigan Department of Transportation
425 W. Ottawa
Lansing, MI 48933

This copy is to be received within three working days after the due date and time specified above. Please do not deliver in person.

Any questions relative to the scope of services must be submitted by e-mail to the MDOT project manager. Any questions must be asked at least three working days prior to the due date and time specified above. All questions and their answers will be placed on the MDOT website as soon as possible after receipt of the questions. The names of vendors submitting questions will not be disclosed.

For a cost plus fixed fee contract, the selected vendor must have a cost accounting system to support a cost plus fixed fee contract. This type of system has a job-order cost accounting system for the recording and accumulation of costs incurred under its contracts. Each project is assigned a job number so that costs may be segregated and accumulated in the vendor's job-order accounting system.

The selection team will review the information submitted and will select the firm considered most qualified to perform the engineering services based on the proposals. The selected vendor will be contacted to confirm capacity. Upon confirmation, that firm will be asked to prepare a priced proposal. Negotiations will be conducted with the firm selected.

MDOT is an equal opportunity employer and MDOT DBE firms are encouraged to apply. The participating DBE firm, as currently certified by MDOT's Office of Equal Opportunity, shall be listed in the Proposal.

The scope of services is attached to this solicitation.

As part of this solicitation the DBE goal is waived.

This project will be classified to be between $25,000 and $100,000 according to Exhibit F.

For the purposes of this RFP, items 5 and 6 of Exhibit F contained in the "Vendor Selection Guidelines document - **Capacity and QA/QC are required as part of the proposal and will be scored.** This change will increase the total number of pages up to a maximum of 7 per Exhibit F.

Please note that three (3) proposals are required to be submitted to the Survey Project Manager.

SCOPE OF SURVEY WORK

Complete Structure (B01) Replacement Survey and Hydraulic Survey

US-24 over the Clinton River C.S.: 63053 - J.N.: 60256 D

Primary Prequalification Classifications:
Structure Surveys; PPMS Task : 3340;
Hydraulic Surveys; PPMS Task : 3350

Submit a Proposal based upon the requirements of the Request for Proposal and this Scope

MAPPING LIMITS: From 500 feet before reference point A to 500 feet beyond reference point B, from Right-of-Way to Right-of-Way.

MDOT TEAM
Any survey related questions over this project may be directed to the Survey Project Manager, Thomas W. Benson, at phone (517) 373-0020.

Any bridge design related questions over this project may be directed to the Project Manager/ Design Engineer, Charles Occhiuto, at phone (517) 373-0742.

GENERAL REQUIREMENTS:

1. Survey must be completed by a survey firm pre-qualified to perform Bridge surveys for MDOT.

2. Surveys must meet all requirements of the Michigan Department of Transportation (MDOT) Standards of Practice dated April 1, 1998. Please contact our office to clarify any specific questions regarding these standards.

3. Consultants must obtain all necessary permits, including an up-to-date permit from the MDOT Utilities Coordination and Permits Section, required to perform this survey on any public and/or private property.

4. The consultant must adhere to all applicable OSHA and MIOSHA safety standards, including the appropriate traffic signs for the activities and conditions for this job.

5. Consultants are responsible for a comprehensive and conscientious research of all records essential for the completion of this project.

6. Surveys must comply with all Michigan law relative to land surveying.

7. Surveys must be done under the direct supervision of a Professional Surveyor licensed to practice in the State of Michigan.

8. Measurements, stationing, recorded data, and computations must be in International Feet.

9. Coordinate values shall be based upon the Michigan State Plane coordinate system (NAD 83). Elevations must be based upon North American Vertical Datum of 1988 (NAVD 88) or alternate acceptable to the Survey Project Manager.

10. The survey notes must be submitted to the Design Survey Unit in 10" by 12" divided portfolios with flap covers. As many portfolios should be used as needed to contain all of the required documents and diskettes

11. Each portfolio must be labeled on the outside per the following example:

    Survey Notes for:
    Location and Project Limits [ ]
    Control Section [ ] Job Number [ ] Date [of submittal]
    By [*Name of Firm*] Route [ ]
    Michigan Professional Surveyor [ ]

12. Each submittal is to be divided into six sections. These sections are to be labeled as follows: **Administrative, Control**, **Alignment**, **Property**, **Mapping**, and **Miscellaneous**.

Note : The CD-ROM must be setup the same way.

a. The administrative section contains the survey order or letter, Form 222; Survey Notes: Receipt and Transmittal, Survey scope, Surveyors Project Report, written minutes of meetings, and the MDOT QA/QC checklist.

b. The Control section contains the data collected and copies of all research documents used to establish the horizontal and vertical reference systems for the project, including a thorough written explanation as to how the systems were established.

c. The Alignment section contains witnesses and stationing of alignment points set or found with an explanation of how the alignment was determined, and all supporting documentation.

d. The Property section contains all information that may be required regarding the real property affected by the project, and all required

property ties. This may include copies of all land corner recordation certificates recorded for the government corners used or reestablished, recorded plats, recorded certified surveys, tax maps, tax descriptions, and riparian ownership.

e. The Mapping section contains all survey notes, research documents, and collected data used to plot the maps necessary for this project. All plots for topography, elevations, utilities and drainage are to be placed in this section.

f. The Miscellaneous section contains any information not included in the previous sections. The surveyors' project report should specify any items included in this section.

13. A portfolio may contain several types of data but, no section is to contain more than a single type. Some sections may not contain data, depending on specified project deliverables. All sheets in a portfolio must be marked with the control section, job number, section number and page number. CD-ROM must be labeled with the control section, job number, data type and file names.

14. The following information is to be submitted on CD-ROM:

    a. Text files, in ASCII format per Attachment ASC, containing the witness lists for the horizontal alignment ties, bench marks, and government corners.

    b. Any other text files are to be in ASCII Format or Microsoft Word.

    c. All pages in the portfolio must be submitted in PDF and be placed in the appropriate folder on the CD.

15. Documents are to be submitted as follows:

    a. All recorded instruments on 8.5" x 11" sheets.

    b. All text files printed on 8.5" x 11" sheets.

    c. All recorded plats and condominiums on 18" x 24" sheets.

    d. All plots on 24" x 36" sheets.

    e. All documents and plots are to be legibly printed or reproduced on white paper.

16. The Consultant representative shall record and submit type-written minutes for all project related meetings to the MDOT Project Manager within two weeks of the meeting. The Consultant shall also distribute the minutes to all meeting attendees.

17. The MDOT Project Manager will be the official contact for the Consultant. The Consultant must either address, or send a copy of all correspondence to the MDOT Project Manager. The MDOT Project Manager shall be made aware of all communications regarding this project.

At the completion of this survey and prior to beginning the design of this project, all field survey notes (legible copies of pages will suffice), all electronic data, and all research records obtained for this project will be considered the property of MDOT and must be sent to the Survey Project Manager. Please use MDOT Form 222(3/99) entitled SURVEY NOTES: RECEIPT AND TRANSMITTAL for all transmittals. A copy of this transmittal form must also be sent to the Project Manager/Design Engineer and the MDOT, Design Division, Survey Project Manager, P.O. Box 30050, Lansing, MI 48909.

It is recommended that the projects survey control be submitted for review as soon as it is available.

PROJECT SCHEDULE

The scheduled survey completion date for the Bridge Survey is April1, 2005.

MILESTONE PAYMENT SCHEDULE

Compensation for this Scope of Design Services shall be on a Lump Sum basis. Such Lump Sum compensation shall be divided into payments for the following portions of the services and in the following amounts:

1. Bridge Design Survey, PPMS Task 3340	50 %
2. Hydraulic Survey, PPMS Task 3350	50 %
Total Reimbursement for services	100 %

All Milestone Payment Percentages are negotiable except for the Final Deliverable Package. The MDOT Project Manager may authorize payment if the milestone is delayed due to circumstances beyond the Consultants control.

Definitions for Milestone Payment Schedule Items:

Design Survey - This payment milestone is considered complete and eligible for compensation when the design survey is received and approved by the MDOT Survey Project Manager.

FIELD SURVEY

The purpose of the field survey is to obtain all information and data required by the project design engineer, to leave control in the field for future construction staking, and to provide a sufficient history of the area to enable the MDOT Design Survey Unit to perform, in the future, dependable surveys. The surveyor must discuss the scope of this survey with the project design engineer before initiating any work on this project. Notes of this meeting must be typewritten and submitted to the Project Manager and Consultant Coordinator within two weeks of this meeting.

The field survey must include, but is not limited to, the following:

CONTROL

HORIZONTAL and VERTICAL CONTROL

A three dimensional coordinate system must be established for this project. The horizontal component of this coordinate system must be based on the Michigan State Plane Coordinate System (NAD 83). The vertical component of this system must be based upon the North America Vertical Datum of 1988 (NAVD 88) or alternate acceptable to the Survey Project Manager. Upon request, the MDOT Design Survey Unit will supply descriptions of nearby published NGS control bench marks. A complete history, as well as a recovery description with new witnesses to be submitted in DDPROC to NGS, for each NGS horizontal control station or bench mark used for this project must be included in the final report submitted to the MDOT Design Survey Unit. The DDPROC program is available through the MDOT Design Survey office.

The horizontal project control for this project will be classified as intermediate project control according to the MDOT Standards of Practice dated April 1, 1998. These points are intended for mapping and should be located outside the proposed construction area to insure their availability for all phases of construction. Each control point must be accurately described and witnessed to at least four nearby features. Please refer to MDOTs Standards of Practice for the minimum requirements for these points.

A closed traverse must be run and adjusted between two or more known points on the project control traverse. Open traverses are **NOT** acceptable. Unadjusted traverse measurements must produce an error of closure of not greater than 1:20,000. Any permissible error of closure shall be distributed throughout the traverse by means of a suitable least squares adjustment software program. These points must not be set greater than 1970 feet or less than 490 feet apart, semi-permanent in nature, and located outside the proposed construction area to insure their availability for all phases of construction. All data collection traverse points and the alignments must be tied to the control established for this project.

All field observations, unadjusted traverse computations and final adjusted coordinates must be included in the notes. A list of all horizontal control points must be developed which includes datum, all point designations, descriptions, coordinates, station and offset, and witnesses. This list must be printed on 8.5" x 11" sheets and placed on CD-ROM, in ASCII format per Attachment ASC. All data relating to the horizontal component of the system must be included in the portfolio.

Elevations must be based upon North American Vertical Datum of 1988 (NAVD 88) or alternate acceptable to the Survey Project Manager. Bridge Seat Elevations must be determined and compared to the elevations from the existing plans.

New bench marks must be set on structures outside the proposed construction area. Each bench mark must be accurately described. A minimum of two bench marks is required, one on each side of the structure, away from the construction limits.

Bench marks for this project will be considered Intermediate Vertical Control according to the Standards of Practice. Leveling must be performed to meet Third Order accuracy standards (0.06 ft times the square root of the distance in miles). Any error of closure must be distributed throughout the level runs by means of a suitable least squares adjustment software program. Open level loops are NOT acceptable.

The bench mark notes must include all field observations, the unadjusted loop closures and the final adjusted elevations. A bench mark list must be developed that includes datum, bench mark designations, descriptions, and elevations. This bench mark list must be printed on 8.5" x 11" sheets and placed on CD-ROM, in ASCII format per Attachment ASC. The printed list and the CD-ROM are to be submitted with the consultants' final report.

The methods used to establish the horizontal and vertical components of the project coordinate control system must be fully discussed in the Surveyor's Project Report.

ALIGNMENT

It is necessary to compute and submit an alignment(s) for this bridge survey – the bridge alignment will be based on the Reference Points as established from field measurements and compared to the existing bridge plans and a road alignment based on ROW sheets and best fit field data if different than the bridge alignment.

The reference points at each end of the bridge as well as the pier reference point must be computed and the coordinates, stationing, and elevation noted for each point and shown in an alignment sketch. This sketch can also be used to portray the crossing angles of the bridge substructure. Measurements and calculations made to establish this baseline must be included in the notes and fully explained in the final report.

PROPERTY

The **property section** for this project will consist of Government corners that may be necessary for alignment establishment, or that fall in the construction area. A list of the adjacent land owners is required for the entire length of the project to include addresses, tax descriptions, and which ones are the riparian owners.

GOVERNMENT CORNERS

Any PLSS corners within the project limits must be recovered or established and tied to the project coordinate system.

All PLSS corners must be recorded in accordance with PA 74 of 1970, as amended and all applicable administrative rules. A copy of each recorded land corner recordation certificate must be submitted to the MDOT Design Survey Office as part of the final report. All PLSS corners located in hard surface roads must be protected by a monument box, regardless of impending construction.

MAPPING

MAPPING LIMITS: From 500 feet before Reference Point A to 500 feet beyond Reference Point B, from Right of Way to Right of Way plus 1 topo point 10 to 15 feet beyond the Right of Way with a maximum of 25 feet between cross sections along US-24. A planimetric and contour map must be provided for the area within the mapping limits. Scale for this project will be 1" = 40' and the contour interval will be 1 foot.

All curb, gutter, cross-culverts, head walls, public or private approaches, and other features which may affect the design of the project within the mapping limits must be accurately described and located. New curb and gutter sections shall be noted as such.

All trees and landscaping within the ROW must be located and identified. Brush areas may be outlined and classified.

All drainage structures in the mapping area will be located and identified.

ELEVATIONS

Cross sections must be taken along the abutment reference lines from shoulder to shoulder, and delivered in sketch format showing location and distance between shots, description and elevation and the Angle of Crossing of Existing Substructure Units.

A plan sketch showing the field measured under clearances at the shoulder points, edge of bit /

concrete, edge of metal, centerlines, etc. for both sides of the bridge and in the middle of the structure and or low point of the structure.
The consultant shall provide bridge seat elevations at abutment fascias, clearly labeled.

UTILITIES

The consultant is required to note any and all visible utilities attached to the bridge and within the limits of the survey as defined by this scope. If none, so note. It is not necessary to contact the individual utility companies to obtain as built plans. A list of said companies with a contact is required.

BRIDGE SPECIFIC INFORMATION

Plan and Elevation views of the structure showing the dimensions of the Substructure, Face to face substructure measurements and Superstructure Elements is required. Top of footing, River bottom elevations, Under clearance elevations, and Water surface elevations need to be detailed on a sketch for each side of the structure. As many hand sketches and marked up Bridge Plan sheets should be generated to convey all required information.

MISCELLANEOUS

Any information that would not be appropriately placed in the control, property or mapping sections must be included in this section. General photographs and local newspaper articles are examples of miscellaneous data.

The surveyor must describe, in the final report, the data included in this section.

FINAL REPORT: DELIVERABLES

The final report for this project shall include the following:

1. In the first pocket of the first portfolio, the projects Professional Surveyor's Report on company letterhead consisting of the following:

    a. A comprehensive synopsis written in non-technical language, and signed by the projects Professional Surveyor, of the work performed on this project.

    b. The source and the methods used to establish the horizontal coordinates, elevations, and the alignment for this project.

    c. A detailed explanation of anything discovered during the survey of this project that may create a problem for the designer or another surveyor.

2. Witness lists for any government corners, alignment / reference points, control points, and bench marks developed per Attachment Asc.

3. Reference line cross-sections.

4. Bridge seat elevations.

5. Utility information.

6. All original field survey notes, all electronic survey data files, all calculation sketches, and all research records obtained for this project. All survey notes are to be placed near the beginning of the Mapping section. All electronic survey data shall be submitted on CD-ROM only, specifically labeled. No paper copy of raw survey data is required.

7. The list of adjacent owner addresses, and tax descriptions for the four quadrants of the project.
8. Legible copies of all recorded Land Corner Recordation Certificates filed or found for the Government corners specified in this scope of survey.

9. It is the responsibility of the consultant to insure that all electronic files submitted to MDOT conform to the required format, and all documents are legible.

10. The consultant must organize and label the various sections of the portfolios as required by the Standards of Practice for MDOT Design Surveys dated April 1, 1998.

11. All documents, pages, files for this project must be placed into a PDF format.

ATTACHMENT ASC

Mandatory ASCII format for control point, alignment point, government corner witness lists, and benchmark list.

1. File must be generated exclusively in ASCII Text format, in a program such as Notepad. Conversions from Rich Text Format, WordPerfect, etc. are not acceptable unless the file can be imported directly into Microstation in proper format.

2. **Do not use Tabs** to align text. Use spaces only.

3. Use normal keyboard keys for fractions. (Ex: ½")

4. For special characters use only the following MDOT Design font zero keyboard keys.

5. Data must be organized as shown in the example below:

FONT O KEY BOARD CHANGES

< = ± (PLUS OR MINUS)
\ = ℄ (CENTERLINE)
} = Δ (DELTA)
! = ø (DIAMETER)
^ = ° (DEGREE)

CONTROL PT#: CP660
DESCRIPTION: Set 5/8" x 3'rerod and yellow S&W cap in west edge of M-95 gravel shoulder, and < 150' north of \ of Norway Dr.
Station 47+38.27, Offset 24.00'Lt
COORDINATES: N = 409,047.6476 E = 13,232,571.566 Elev = 892.864
Combined Scale Factor: 0.99996741
WITNESSES:
1. EAST 16.45' \ of N-S concrete M-95.
2. SOUTH 6.05' North edge of concrete base of "Sagola City Limits" sign.
3. S84^W 16.66' Set nail and S&W tag in north face of power pole.
4. S43^E 73.82' Set nail and S&W tag in S.W. face of 6" ! maple.

6. Data must be capable of being imported directly into Microstation, while retaining basic structure and showing proper symbols such as degree and centerline.

7. Prior to importing text files into Microstation, the font must be set to 0, Height must be set to 12, Width must be set to 10, and Line Spacing must be set 8 in the Microstation-Element-Text Dialog Box. Also, in the same Dialog Box, single line and multi-line justification must be set to Left.

8. A Microstation file must be saved and submitted with the appropriate control point, benchmark and witness data. This file must be named Job#wit.dgn.

Attachment E

MDOT QA/QC Certification Check List

(May 2004)

The purpose of this checklist is to insure that critical items are checked prior to submitting the project for review and acceptance. The proper use of this document should drastically reduce the amount of time spent by MDOT and Consultant personnel correcting oversights and omissions from the project. The last page of this list is to be used to provide a brief explanation of why an item is being omitted. If a particular item is not applicable simply check NA, no explanation is necessary. **Failure to complete and include this list with the final project portfolio will result in the immediate return of the portfolio for completion.**

NOTE : Be sure that the latest CAiCE files and Tugboat from the MDOT FTP site are utilized.
Be sure that the latest PDF requirement is accomplished.

√	NA	**Portfolio:**
____	____	Two complete sets of survey data have been compiled for delivery.
____	____	Portfolio labeled as per Scope.

Portfolio Pocket Contents:

Administrative:

____	____	**The MDOT Survey Contact is _____ _____.**
____	____	MDOT Transmittal Form 222
____	____	Table of Contents matching the portfolio contents
____	____	MDOT QA/QC Certification Check List
____	____	All portfolio pages scanned into PDF format
____	____	Comprehensive project survey report in Microsoft Word. Also, include a synopsis of the report that pertains to that section in the front of each pocket in the portfolio.
____	____	MDOT Authorization Letter
____	____	Copy of Project Scope of Work
____	____	Copy of Proposed Work Plan and Schedule
____	____	Copy of all Work Permits required for the project
____	____	All correspondence including all E-mails (change of scope, change of schedule, phone records etc.)
____	____	**All Project and PDF files must be archived in subdirectories matching each**

portfolio pocket on the Compact Disc (CD) including: CAiCE archive (.zip), Microstation drawing file (.DGN) which must also be in their original format.

____ ____ All required ASCII files and Microsoft Word documents.

√ NA

____ ____ All Project files and CAICE archive recorded on a Compact Disc (CD) named the same as the job number (#####c) and all files under the appropriate directory headings:

ADMINISTRATION__, CONTROL__, ALIGNMENT__, PROPERTY__, MAPPING__, MISCELLANEOUS__.

Control:

____ ____ Control Point List in Microsoft Word and ASCII text formats with:
Datum __, Description __, Coordinates with Std. Err. __, Station-offsets __, Scale Factors __, Witnesses __, Geoid used __, Grid ___ or Ground ___ Plane.

____ ____ Statement with formula to convert from Grid to Ground on Control Point list.

____ ____ Bench Mark List in Microsoft Word and ASCII text formats with:
Datum __, Descriptions __, Elevations __, Station-offsets __.

____ ____ Control Point least squares adjustment statistical report (ASCII) showing Reference Factors and weighting strategies

____ ____ Benchmark level loop - least squares adjustment report (ASCII)
All level loops should be in one adjustment run if at all possible.

____ ____ G.P.S./traverse adjusted coordinates with standard errors

____ ____ **Level adjustment report, showing to the hundredth of a foot,**
___ 0.06ft error per √Mi
___ 0.04ft error per √Mi

____ ____ Sketch or plot of network or traverse

____ ____ NGS or MDOT data sheets of existing control

____ ____ DDPROC - .ha files printout, or copy of Mark Recovery Form submitted on the NGS website for stations recovered and used for Horizontal and / or Vertical Control

Alignment:

____ ____ A sketch or CADD drawing of the alignment with:
stationing __, horizontal coordinates __, curve data __, alignment points found or set __, source of stationing __.

____ ____ Control sketch with control points, government corners and alignment plotted.

____ ____ A report discussing in detail the type of alignment, source of the stationing and how it was determined.

____ ____ Alignment point list in Microsoft Word and ASCII text formats with:
Datum __, Description __, Station __, Coords. with Scale Factors__, Witnesses __.

√ NA

____ ____ **Describe Alignment Chain(s)** (ASCII) from CAiCE
Coordinates__, Bearings__, Distances__, Curve data__, Stationing**__.**

Property:

____ ____ Recorded copies of all LCRCs required for the project.

____ ____ Government Corner list in Microsoft Word and ASCII text formats with:
Datum __, Corner names__, Coordinates, Scale Factors, and 4 witnesses __, Indication of which corners are in danger of destruction __.

____ ____ Section Corner ties to the alignment with station, distance and bearing along the section line.

____ ____ Section map with bearings, distances between Government corners.

____ ____ Copy of submittals to county Remonumentation (if required)

____ ____ Copies of all research documents, tax maps, tax descriptions, deeds, recorded plats, surveys, etc.

____ ____ A separate plot of alignment or tax map showing all property irons found, with point numbers.

____ ____ Property Corner report (ASCII) with
Coordinates with Scale Factors__, Station-offset__, Description__, Feature code__, Alignment name__.

____ ____ A station-offset listing of property irons.

Mapping:

____ ____ * **A legible planimetric plot (2d Microstation Drawing) generated from the MDOT (CAiCE) Plans Production Tugboat, including:**
contours __, MDOT Cells symbology __, Centerline alignment shown __.

____ ____ A second plot showing all surface materials, utility connectivity and other pertinent notes or comments.

____ ____ All plots certified as per scope.

____ ____ All field survey notes obtained for this project.

____ ____ Drainage structure inventory is:
correlated to the structures shown on the plot __, includes all pertinent data about the structures: Station and offset __, coordinates __, structure name __, rim elevations __, invert depths with corresponding computed invert elevation__, pipe sizes __, directions __, structure cover type __, culvert size, material, condition __, headwall or end section description __.

√ NA

____ ____ INDIVIDUAL UTILITY REPORTS (ASCII) for each utility with:
Designation__, Coordinates__, Elevation__, Description__, Feature Code __, Station-Offset__.

____ ____ Utility Owner listing (ASCII) with:
Name of Utility__, Address__, Phone number__, Contact Person__.

____ ____ Drainage structure report (ASCII or a spreadsheet compatible with MDOT software) of manholes and catch basins with:
Designation__, Coordinates__, Elevation__, Description__, Feature Code__, Station- offset__, Invert and Pipe Dimension information__, Structure condition__.

____ ____ Culvert Structure report (spreadsheet compatible with MDOT software) with:
Designation__, Coordinates__, Elevation__, Station-offset__, Size and Material__.

____ ____ Drainage Report (dissertation of conversations with local people and own visual inspection of the project area.

____ ____ A list of all utilities noting utility name, address, phone number and contact person.

____ ____ Station Offset report for each utility feature.

____ ____ As-Built plans from each utility.

Miscellaneous:

____ ____ Miscellaneous Information Included

____ ____ Digital or Scanned Photographs

Bridge Specific Information:

____ ____ Sketch of structure* in elevation view including:
Ref. Line to Ref. Line Dimensions___, Ref. Pt. Elevs.___, Ref Pt. Stations___, Underclearance Elev.___, Abutment, bridge seat and Pier cap Elev.___, Ftg. Elev. (if

requested)___, face to face abutment and pier dimensions____, **top of Water elev.____, stream bed elevs.____, lower roadway elevs.____.**

____ ____ Sketch of structure* in Plan View including:
Ref. Pt. Elevs.___, Ref Pt. Stations___, Ref Pt. Coordinates___, Alignment___, Angle of Crossing___, Deck dimensions___, Abutment and Pier cap dimensions___.

____ ____ Explanation of how reference point locations were determined.

***** If plans are available this information may be shown on existing plan sheets.

√ NA

CAiCE File

____ ____ Project Name is MDOT Job Number (#####c)
____ ____ CAiCE Project Description field is filled out
____ ____ **Correct Units (International Feet) selected in System Settings**
____ ____ Correct Datum Selected in System Settings
____ ____ **Z Coordinate value set to 4.2 in System Settings**
____ ____ Correct MDOT Feature Table Attached prior to Data importation
____ ____ Correct MDOT Cell Library Attached prior to Data importation
____ ____ Only MDOT Feature Codes Used
____ ____ All points have appropriate Descriptions
____ ____ Desired plot scale checked with designer
____ ____ All survey chains edited and properly connected prior to DTM creation.
____ ____ All survey chain crossings resolved.
____ ____ All survey chain curves checked for correctness and aesthetics.
____ ____ No survey chain curves are shown as chords.
____ ____ Survey chain Patterns checked for proper direction (guardrail, railroad, tree line, etc)
____ ____ Hydro survey chains checked for correct left to right direction.
____ ____ **Single DTM Surface is named EX (multiple surfaces = EX1, EX2, etc.)**
____ ____ DTM checked for invalid break lines
____ ____ DTM checked for invalid point data (spikes/holes)
____ ____ DTM triangles checked for spikes and dips
____ ____ Long or invalid triangles have been obscured from TIN
____ ____ Bridge decks and data suspended above natural terrain/substructures have been removed from the terrain surface prior to triangulation.
____ ____ Terrain surface beneath bridge decks is included in DTM
____ ____ Underwater areas have been removed from terrain surface prior to triangulation
____ ____ * **Text size is dependent on the scale**
___ 100 scale, text size = 9.0
___ 50 scale, text size = 4.5
___ 40 scale, text size = 3.6
____ ____ * **Cell Scale set to: ____ 1.0 (1":100'), ____0.5 (1": 50'), ___0.4 (1": 40')**
____ ____ * **Contour Interval set to 2 in DTM Settings**
____ ____ * **Max. Offset for contour smoothing set to 1 in DTM Settings.**

Contour Object Display Settings:

____ ____ * **Contour interval set to 2 regular and 10 index .**
____ ____ * **All contour colors set to 5, Index set to 2**
____ ____ * **Line weights set to 0 regular, 1 Index**
____ ____ * **All contour levels set to 20**
____ ____ * **Index Label spacing set to 60, color set to 5**
____ ____ * **Character height is dependent on the scale;**
____ 100 scale, character height = 9.0
____ 50 scale, character height = 4.5
____ 40 scale, character height = 3.6
____ ____ * Label Depression Contours unchecked
____ ____ * Final contours computed after DTM edits and settings checked

√ NA

Display:

____ ____ * Scale and text size checked prior to display
____ ____ * Survey Chains displayed as per Attachment 'AA'
____ ____ * Survey Points displayed as per Attachment 'AA'
____ ____ * Alignment geometry chain Feature Code is SCL
____ ____ * Alignment geometry chain is displayed
____ ____ * Contours are displayed
____ ____ * Point descriptions displayed as per Attachment 'AA' and scope
____ ____ * All overlapping text has been clearly resolved (if requested in scope)
____ ____ * All subsurface drainage can be correlated with inventory sheets.
____ ____ * CAiCE drawing file created and named Job # +pl.cdg (#####cpl.cdg)
____ ____ * **Correct seed file selected for Microstation file conversion**

	DATUM		**SEED FILE**
___	**Assumed**	___	**MiDOT2d.dgn**
___	**SPC83 South**	___	**Seedfs.dgn**
___	**SPC83 Central**	___	**Seedfc.dgn**
___	**SPC83 North**	___	**Seedfn.dgn**

____ ____ * **Correct cell file selected for Microstation file conversion (midote_02.cel)**
____ ____ Microstation file of Bridge structures created with Contours (Plan of Site)
____ ____ * **Geopak files generated from the MDOT Plans Production tugboat/macro.**
____ 3d Microstation DGN triangle file, ____Survey Chain (TIN Boundary) around edited triangle file with the name and feature "CLIP",
____ Job #.OBS and Job #.XYZ files (can only be generated from tugboat)
____ ____ **CAiCE archive file named Job# (#####c.zip)**
____ ____ Project portfolio labeled and includes data as per scope.
____ ____ **Used MDOT's Plans Production tugboat/macro.**

* Many of the asterisk items can be easily completed in CAiCE using the CAiCE Tugboat/Macro "MDOT Plans Production". Contact your project Consultant Coordinator for information about this CAiCE tugboat.

√	NA	
____	____	**All paper pages in the portfolio must be scanned into a PDF format file even if already existing in electronic form. An example will be supplied if requested.**
____	____	**Create one .DGN file with the Control point list, Benchmark list, Alignment point list, and Government Corner list per Attachment ASC named the Job # (xxxxxxxWIT.DGN).**
____	____	**Scope has been reviewed to insure compliance.**

I have reviewed the survey notes and scope of work and certify that all required and requested information is present in the portfolio in compliance with the MDOT Survey Standards of Practice, the survey scope of work and this QA/QC Check List. Any information omitted from this submission has been explained on the sheet attached.

SEAL

_____
Professional Surveyor #

Explanation of Omissions

SCOPE FOR HYDRAULIC SURVEY

B01 of 63053 **Job No. 60256D**
US-24 over the Clinton River
Oakland County

The consultant shall perform a hydraulic survey, which provides geometric data on the stream channel upstream and downstream of the structure. **Two weeks** prior to starting the hydraulic survey, the consultant surveyor shall contact the Design Engineer-Hydraulics/Hydrology to schedule a site visit with an MDOT Hydraulics engineer. The purpose of the site visit is to discuss details of the survey and to clarify the intent of the survey. At this time the Design Engineer-Hydraulics/Hydrology is Kristin Schuster (517-335-1919). Notes must be taken at the site visit and submitted promptly to the Survey Consultant Coordinator.

Prior to performing the survey, the consultant must contact all landowners upon whose lands they will enter. The contact may be personal, phone or letter, but must be documented. This notice must include the reasons for the survey on private land, the approximate time the survey is to take place, the extent of the survey including potential brush cutting, and an MDOT contact person (the MDOT project manager).

The consultant must make every effort to minimize brush cutting on private property. The use of paint on private property is prohibited.

Cross-sections shall be taken at the limits and intervals specified by the Design Engineer-Hydraulics/Hydrology as shown in Attachment A. Channel cross-sections shall be taken normal to the direction of *flood* flow and tied to the roadway alignment baseline established for the structure or to a project coordinate system so they can be accurately plotted. The sections shall be extended to the edge of the floodplain, to the elevation of the top of the road at the structure, or to a distance beyond the river bank agreed upon with the MDOT Hydraulics engineer at the site visit. Shots must be taken at approximately six foot intervals through the stream. Any high water marks and date of occurrence (if available) shall be noted.

All elevations shall be referenced to the North American Vertical Datum of 1988 (NAVD88), or project datum, if different. Two benchmarks must be established at the stream crossing, one on either side of the structure. All benchmarks must be accurately described. Benchmark leveling shall be a closed loop of at least third-order accuracy, which requires an error of closure between

known benchmarks of not more than 0.06 feet times the square root of the distance in Miles.

Since the hydraulic analysis is to be performed by MDOT staff, the consultant shall meet the following requirements for hydraulic cross-sections:

1. Cross-sections shall be submitted electronically in CAiCE format, or in a form acceptable to the Design Engineer-Hydraulics/Hydrology.

2. Each cross-section shall be a separate chain in CAiCE named "HYDRO1, HYDRO2", etc. The numbers need not be in sequence. HYDRO chains shall have a Feature Code of HYDRO. Road centerline profiles shall have a Feature Code of CL.

3. HYDRO chains must have a CAiCE Description of 10, 20 30, etc., beginning with 10 at the downstream cross-section and proceeding upstream sequentially

4. Each cross-section shall be submitted with the points in the chain running all left to right, looking downstream.

5. The cross-sections shall be submitted sequentially, beginning at the downstream end and proceeding upstream.

6. For each cross-section, the vegetation break point (the "friction point" between the natural channel and the surrounding vegetation) shall be shot with a feature code of "RBANK" or "LBANK" on the right or left side of the waterway, respectively. It should have a comment or description of "break point."

7. Subsequent vegetation break points, if applicable, shall be shot as "VEGE" with a comment or description such as "friction point-grass to shrub."

8. The water surface elevations at each cross section shall have a feature code of "LWSEL" and "RWSEL", taken at the left edge of water and right edge of water, respectively.

9. On the cross-section at the upstream face of the abutments, a shot is required on the ground at each abutment face on the stream side. These shots shall be described as "at abutment face."

10. On the cross-section at the downstream face of the abutments, a shot is required on the ground at each abutment face on the stream side. These shots shall be described as "at abutment face". On the cross-section at the upstream face of the abutments, a shot is required on the ground at

each abutment face on the stream side. These shots shall be described as "at abutment face".

The survey notes must be submitted to the Design Survey Unit in 10" by 12" divided portfolios with flap covers. Each portfolio must be labeled on the outside as follows:

Hydraulic Survey Notes for:
Route [ ]
Location and Project Limits [ ]
By [*Organization*]
Michigan Professional Surveyor [ ]

THE NOTES FOR THE HYDRAULIC SURVEY MUST BE PACKAGED IN A SEPARATE PORTFOLIO. All field measurements, notes, sketches, and calculations must be included in the final transmission.

The project surveyor must ensure that all required information is legible and in a form which is easily accessible to the Hydraulics/Hydrology Unit.

Note: It is not necessary to provide least squares analyses for horizontal and vertical control for a Hydraulics Survey. Evidence of horizontal and vertical closure is required. The consultant surveyor must use professional judgment to determine whether the closures are acceptable for use on a Hydraulics survey. It is necessary to provide accurate elevations for under clearances, road profiles, weirs, and anything that controls flow. It is not necessary to provide extremely accurate closures for vertical and horizontal control used for hydraulics cross-sections.

It is not necessary to provide a witness list of horizontal control points set for hydraulics cross-sections.

A list containing two benchmarks, one on either side of the bridge, with descriptions, elevations and datum, must be provided.

ATTACHMENT A

B01 of 63053 **Job No. 60256D**
US-24 over the Clinton River
Oakland County

Please provide the following information:

1. All pertinent structure data including water surface elevations, flow lines, and under clearance elevations, both upstream and downstream, at the structure. Include a sketch of the structure showing all of this information.

2. One road profile along the crown of the existing roadway.

3. Two cross sections, one at the upstream and one at the downstream face of the structure excluding roadway embankment.

4. Two cross sections, one 50 feet upstream and one 50 feet downstream from the face of the structure.

5. Two cross sections upstream at 100 foot intervals commencing 100 feet from the upstream face of the structure.

6. Two cross sections upstream at 200 foot intervals commencing 400 feet from the upstream face of the structure.

7. Two cross sections downstream at 100 foot intervals commencing 100 feet from the downstream face of the structure.

8. Repeat items 1, 2 and 3 at the downstream railroad bridge.

9. Two cross sections, one 100 feet upstream and one 100 feet downstream from the face of the railroad bridge.

10. All pertinent structure data including water surface elevations, flow lines, and under clearance elevations at any other structures encountered within the reach of the survey. Include sketches of these structures showing all of this information.

11. First floor elevations of all buildings within the survey

limits.

12. The riparian owners in the four quadrants of the structure.

13. Water surface elevations at each section must be provided, with the date taken. The water surface elevations at each cross section shall be taken at the left edge of water and right edge of water. **All water surface elevations should be taken on the same day if possible.** If not, note the date taken and any event which may affect the evaluation.

14. A point list in ASCII format shall be provided, containing columns for point number, North (or Y), East (or X), elevation, and description.

15. One control sketch to scale, or CAD drawing, showing the relationship of the cross-sections to the structure and the road, with the RBANK shots connected and the LBANK shots connected.

16. One control sketch to scale, or CAD drawing, of the area at the stream crossing, showing a basic map of the bridge including abutments and cross section shots (numbered).